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7-16-99  
Docket  
1063

Response Under 37 C.F.R. § 1.192  
Expedited Procedure  
Examining Group 1600

PATENT APPLICATION  
SERIAL NO. 09/040,161  
ATTY. DOCKET NO. 2509-980383

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Group Art Unit 1623 :

In re application of :

Paul L. KORNBLITH : METHOD FOR PREPARING CELL  
CULTURES FROM BIOLOGICAL  
SPECIMENS FOR CHEMOTHERAPEUTIC  
AND OTHER ASSAYS

Serial No. 09/040,161 :

Filed March 17, 1998 :

Examiner Ralph Gitomer :

Pittsburgh, Pennsylvania  
May 17, 1999

APPEAL BRIEF

Box AF  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

This Appeal Brief is filed further to the Notice of Appeal filed in the above-identified patent application on February 15, 1999. The Notice of Appeal appeals the decision of the Examiner dated October 13, 1998 finally rejecting claims 13-20.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, VA 22202-3513 on May 17, 1999.

Barbara E. Johnson, Registration No. 31,198  
(Name of Registered Representative)

Barbara E. Johnson 05/17/99  
Signature Date

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02 FC:219

The headings used hereunder and the subject matter set forth under each heading are in accordance with 37 C.F.R. § 1.192(c).

I. REAL PARTY IN INTEREST

The real party in interest is the Applicant of the above-identified application as listed in the caption of this Brief.

II. RELATED APPEALS AND INTERFERENCES

No other Appeals or Interferences are known to the Applicant, Applicant's representative, or Applicant's assignee which would be affected by or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Each of claims 13-20 are finally rejected in the Final Office Action dated October 13, 1998. Claims 13-20 are reproduced in Appendix A.

IV. STATUS OF AMENDMENTS

Subsequent to the Final Office Action dated October 13, 1998, an Amendment to claims 13 and 20 was submitted on January 13, 1999. In an Advisory Action dated February 1, 1999, Applicant was advised that the Proposed Amendment would be entered upon filing of a Notice of Appeal and an Appeal Brief.

V. SUMMARY OF THE INVENTION

As described in the specification, the invention defined in the claims on appeal is a method of screening a number of candidate therapeutic or chemotherapeutic agents for efficacy as to a specific patient (page 2, lines 28-31).

The claimed method includes the steps of harvesting a tissue sample from a patient, preparing and culturing the tissue sample, and exposing subcultures of the sample to a plurality of treatments and/or therapeutic agents to identify the best treatment protocol for the patient (page 2, lines 31-35).

More particularly, a tissue sample is harvested from the patient by a suitable biopsy or surgical procedure (page 4, lines 30-35). Preparation of the tissue sample includes subdividing or mincing the sample, placing the sample in growth medium and further mincing the sample into cohesive multicellular particulates (page 5, lines 2-15). The resulting particulates are placed in sterile growth medium and are incubated to grow out a monolayer of cells (page 5, lines 30-31). The growth of these cells may be monitored by periodically counting the cells in the monolayer on a periodic basis (page 6, lines 17-20). Cultured cells are suspended and are removed from the culture flask (page 8, line 8) to be dispensed in segregated sites (page 8, lines 34-36). The cells in the segregated sites are exposed to active agents (page 9, lines 5-7) for a period of time and are then counted (page 10, lines 5-8). The process leads to the determination of the most appropriate agent and the most appropriate concentration of that agent for actual patient exposure (page 11, lines 6-10).

#### VI. ISSUE PRESENTED

The issue presented by this appeal is whether, under 35 U.S.C. § 112, first paragraph, claims 13-20 are enabled in view of the disclosure of the specification and the general knowledge in the art.

## VII. GROUPING OF CLAIMS

Claims 13-20 stand or fall together.

## VIII. ARGUMENT

Claims 13-20 stand finally rejected under 35 U.S.C. § 112, first paragraph, as based on a disclosure which is purportedly not enabling.

The Examiner's position is that the size of the claimed cohesive multicellular particulates is critical or essential to the practice of the invention. The Examiner concludes that, because the size of the particulates is not included in the claims, the claims are not enabled by the disclosure. The Examiner alleges that the specification, though being enabling for particles of a specific size ( $1 \text{ mm}^3$ ), does not reasonably provide enablement for particles of other sizes, and, hence, that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with the claims.

In rejecting each of the appealed claims for lacking enablement by allegedly not claiming a critical feature, the Examiner has ignored the standard for enablement rejections, set forth in MPEP § 2164.08(c) :

[A]n enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended.

The specification provides a preferred sample size, but states that it is not necessary that the sample be this size. The language of the specification does not state that adherence

to the 1 mm<sup>3</sup> size is critical; it states that "[p]referably but not necessarily, the tumor particulates each measure 1 mm<sup>3</sup>" (page 5, lines 15-16).

In support of the rejection of claims 13-20, the Examiner cites *In re Mayhew*, 517 F.2d 1229, 188 U.S.P.Q. 356 (CCPA 1976). In the cited case, claims that failed to include an essential step in a method were found to be properly rejected because of the emphasis, in the specification, on the special nature of the step. However, in the same cited case, the Examiner's rejection of claims for failing to include a temperature range for the essential step was found to be improper because the cooling function of the temperature range was self-evident.

By application of the reasoning of *In re Mayhew*, Applicant's claims should be allowed. Applicant has omitted no steps in the description of the sample preparation process. The sample size is selected for a function which is clearly evident from the specification culturing a tissue sample. Applicant has provided sufficient information in the specification for a suitable sample size to be selected and, as is noted in *In re Mayhew* (op. cit. at 1233), the claims must be read in light of the specification.

*In re Wands* indicates the enablement standard—whether the disclosure, when filed, contained sufficient information regarding the subject matter of the claims to enable one skilled in the pertinent art to make and use the claimed invention without undue experimentation. *In re Wands*, 858 F.2d 731, 737,

8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1988). Factors to be considered in this determination include, but are not limited to:

- (A) The breadth of the claims;
- (B) The nature of the invention;
- (C) The state of the prior art;
- (D) The level of one of ordinary skill;
- (E) The level of predictability in the art;
- (F) The amount of direction provided by the inventor;
- (G) The existence of working examples; and
- (H) The quality of experimentation needed to make or use the invention based on the content of the disclosure.

Wands at 737.

When the claims are viewed in light of these factors, they are found to enable a range of particle sizes. A proper analysis of the scope of the claims takes into account what is well-known in the art, and the level of knowledge of one with ordinary skill in the art. However, apparent limitations need not be included in the specification or the claims. "In order to be enabling under 35 U.S.C. § 112, a patent application must sufficiently disclose an invention to enable those skilled in the art to make and use it. The specification need not disclose what is well known in the art." See also *In re Buchner*, 929 F.2d 660, 661, 18 U.S.P.Q.2d 1331, 1332 (Fed. Cir. 1991).

In addition, the specification provides a context for the application of knowledge of the prior art. The specification, in describing the multicellular particulates, in describing a preferred size for the particulates, in describing the desired growth character of a monolayer prepared from 1 mm<sup>3</sup> particulates, and in listing the devices and describing the techniques used in tissue culturing, provides a context from which a person skilled in the art can determine what sample sizes are called for. The present disclosure provides significantly

more information than the disclosure found to be enabling *In re Bundy*, 642 F.2d 430, 434, 209 U.S.P.Q. 48, 51-52 (CCPA 1981), in which the court ruled that the appellant's disclosure was sufficient to enable one skilled in the art to use the claimed analogs of naturally-occurring prostaglandins, even though the specification lacked any examples of specific dosages, because the specification taught that the novel prostaglandins had certain pharmacological properties and possessed activity similar to known E-type prostaglandins.

In practicing the present invention, if a sample were too large, it would be impracticable to culture it due to size limitations of the standard culture vessel used to culture the cohesive multicellular particulates. Also, removal of a total organ, limb, or head (as the Examiner suggests is covered by the claims) would be contrary to the purpose of culturing the cells of the present invention, which is to assess a biopsy sample, not an amputated body part. The purpose of the present invention is to provide a means to ascertain optimal treatment of a malignancy, ironically so as to avoid gross surgical intervention, such as amputation or removal of an entire organ.

Similarly, if a sample is too small (i.e., does not contain a requisite minimum number of viable cells), it will not yield the desired monolayer. A skilled practitioner would not deviate from the roughly 1 mm<sup>3</sup> size without empirically determining whether the smaller sizes are as effective as the 1 mm<sup>3</sup> samples in creating a monolayer which reflects a cancer in a patient. The lower and upper size limitations are very easily deduced according to the teachings of the specification by

comparing parallel cultures of cells derived from particulates less than 1 mm<sup>3</sup> to cultures derived from 1 mm<sup>3</sup> particulates of the same sample to determine when the parallel cultures share growth characteristics and react similarly to the same therapeutic agents.

Tissue culturing techniques are well-known. A large variety of culture media, culture vessels and incubation conditions are well-known in the art. A very large number of tumor cells have been cultured (see Appendix B, an excerpt from ATCC CELL LINES AND HYBRIDOMAS, 8th Edition (1994), pp. 561-568 (Tumor Index)). Further, the addition of chemicals to culture media to ascertain the effects of the chemical on the cells is well-known. Once a skilled person is instructed to use cohesive multicellular particulates to prepare the cell culture of the present invention and that the size of particulates in a working example can be, as a preferred example, 1 mm<sup>3</sup>, the skilled person would be able to culture the cells and determine whether the cells are growing, whether they are sensitive to a therapy, and, as discussed above, whether the cells reflect the growth characteristics and therapy sensitivity of the patient's tissue, within a reasonable range of sizes of cohesive multicellular particulates as could be determined as described above.

The enablement standard also involves the quantity and type of experimentation needed to make and use an invention, and the quantity and type of direction provided in the specification. "The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a

reasonable amount of guidance with respect to the direction in which the experimentation should proceed.'" *In re Wands* (*op. cit.* at 737, 1404, citing *In re Jackson*, 217 U.S.P.Q. 804, 807 (Bd. App. 1982)). No experimentation is needed to practice the present invention, since a sample size is specified in the disclosure. The specified sample size, when cultured, produces the desired tissue sample. Varying sample size involves the simple selection of a particle size and comparison of the resultant monolayer with a monolayer prepared from cells of about 1 mm<sup>3</sup>. This process is a change in a single numerical variable; it is not the unguided selection of a technique or material from a myriad of possibilities that could constitute undue experimentation.

In addition to supplying information on the size of the sample, the specification also provides guidance in the form of context. Given the benchmark provided, the experimenter can use larger sample sizes or smaller sample sizes. The example of the specification discloses that the tissue sample is to be placed into culture medium and "minced by using two sterile scalpels in a scissor-like motion, or mechanically equivalent to manual or automated opposing incisor blades.... Preferably but not necessarily, the tumor particulates each measure 1 mm<sup>3</sup>." (Page 5, lines 10-16) A person using this procedure will produce a population of particulates which will work in the practice of the invention with a range of larger and smaller particulates.

#### IX. CONCLUSION

The Examiner's rejection of claims 13-20 does not meet the standard for an enablement rejection based on the asserted

grounds that a disclosed critical limitation is missing from a claim. The language of the specification clearly states that cohesive multicellular particulate size is not critical. As described above, no undue experimentation is required to determine a suitable multicellular particulate size to practice the invention.

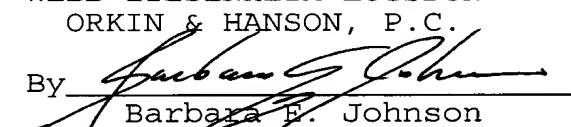
Reversal of the final rejections and allowance of claims 13-20 are respectfully requested.

The original and two (2) copies of this Appeal Brief are enclosed along with a check in the amount of \$150.00 for the filing fee as required by 37 C.F.R. § 1.17(c).

Respectfully submitted,

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Appendix A

13. A method for preparing a biopsy sample of tissue containing malignant cells for chemosensitivity testing, compromising:

(a) obtaining a tumor specimen from a biopsy sample of tissue containing malignant cells;

(b) mechanically separating said specimen into cohesive multicellular particulates having smooth cut edges;

(c) growing a tissue culture monolayer from said cohesive multicellular particulates having smooth cut edges;

(d) inoculating cells from said monolayer into a plurality segregated sites;

(e) treating said plurality of sites with at least one agent; and

(f) assessing chemosensitivity of the cells in said plurality of sites.

14. The method according to claim 13 wherein said plurality of segregated sites compromise a plate containing a plurality of wells therein.

15. The method according to claim 14 wherein said plurality of wells is treated over a length of time adequate to permit assessment of both initial cytotoxic effect and longer term inhibitory effect of at least one of said plurality of active agents.

16. The method according to claim 15 wherein step (d) is accomplished by a multiple well pipetting device.

17. The method according to claim 16 wherein the cells in step (d) are further suspended in medium prior to inoculation into said plate containing a plurality of wells therein.

18. The method according to claim 17 wherein said agent is at least one of the agents selected from the group consisting of a radiation therapy agent, a radiation therapy sensitizing agent and a radiation therapy desensitizing agent.

19. The method according to claim 17 wherein said agent is an immunotherapeutic agent.

20. A method for preparing a biopsy sample of tissue containing malignant cells for chemosensitivity testing, comprising:

(a) obtaining a tumor specimen from a biopsy sample of tissue containing malignant cells;

(b) mechanically separating said specimen into cohesive multicellular particulates of minced tumor tissue;

(c) growing a tissue culture monolayer from said cohesive multicellular particulates of minced tumor tissue;

(d) inoculating cells from said monolayer into a plurality of segregated sites;

(e) treating said plurality of sites with at least one agent; and

(f) assessing chemosensitivity of the cells in said plurality of sites.



ATCC  
CELL LINES  
and  
HYBRIDOMAS

8th edition  
1994

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A user's guide is inside the  
front cover.



American  
Type Culture  
Collection

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# **ATCC**

# **Cell Lines and Hybridomas**

## **Eighth Edition, 1994**

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\* No additional details; for an explanation see NBL Introduction, p. 344.

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lung, carcinoma, large cell	NCI-H460	HTB-177	315	prostate	DU145	HTB-81	281
	NCI-H661	HTB-183	319		LNCaP.FGC	CRL-1740	163
	NCI-H810	CRL-5816	203		LNCaP.FGC	CRL-10995	226
	NCI-H1155	CRL-5818	204		10		
	NCI-H1299	CRL-5803	201		NCI-H660	CRL-5813	203
lung, carcinoma, non-small cell	NCI-H23	CRL-5800	200		PC-3	CRL-1435	142
	NCI-H125	CRL-5801	200	rectum	SW 837	CCL-235	125
	NCI-H157	CRL-5802	200		SW 1463	CCL-234	124
	NCI-H322	CRL-5806	201	skin	A-431	CRL-1555	148
	NCI-H358	CRL-5807	202	stomach	AGS	CRL-1739	169
	NCI-H522	CRL-5810	202		Hs 746T	HTB-135	303
	NCI-H727	CRL-5815	203		KATO III	HTB-103	287
	NCI-H1404	CRL-5819	204	submaxillary gland	RF-1	CRL-1864	180
	NCI-H2126	CCL-256	138		RF-48	CRL-1863	179
lung, carcinoma, small cell	DMS 53	CRL-2062	199	testis	A-253	HTB-41	260
	DMS 114	CRL-2066	200		Cates 1B	HTB-104	288
	DMS 153	CRL-2064	199		NTERA-2	CRL-1973	188
	NCI-H69	HTB-119	294		cl.D1		
	NCI-H82	HTB-175	314		Tera-1	HTB-105	288
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					SW 579	HTB-107	289
				tongue	TT	CRL-1803	174
					SCC-4	CRL-1624	156
					SCC-9	CRL-1629	157
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					SCC-25	CRL-1628	157

\* No additional details; for an explanation see NBL Introduction, p. 344.

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<b>Carcinoma (continued)</b>							
human, unknown	Hs 696	HTB-151	307	mouse	PLC/PRF/5	CRL-8024	205
vulva	SW 954	HTB-117	293		Hepa 1-6	CRL-1830	176
	SW 962	HTB-118	293	rat	Hepa-1clc7	CRL-2026	195
mouse	E	CCL-77	45		H4TG	CRL-1578	150
ascites	P19	CRL-1825	175		H-4-II-E	CRL-1548	147
embryo	RAG	CCL-142	82		H-4-II-E-C3	CRL-1600	153
kidney	LL/2	CRL-1642	158		McA-RH7777	CRL-1601	153
lung	CMT-93	CCL-223	118		McA-RH8994	CRL-1602	154
rectum	KLN 205	CRL-1453	143		MH <sub>1</sub> C <sub>1</sub>	CCL-144	83
squamous cells	SCC-PSA1	CRL-1535	146		NI-S1	CRL-1604	154
stem cells	SCA-9	CRL-1734	168	trout	NI-S1 Fudr	CRL-1603	154
submandibular gland	clone 15				RTH-149	CRL-1710	166
testis	F9	CRL-1720	167				
	NULLI-SCC1	CRL-1566	148	<b>Histiocytoma</b>			
thyroid	MTC-M	CRL-1806	174	human	GCT	TIB-223	341
rat				Islet cell tumor			
intestine, small	IA-XsSBR	CRL-1677	163	rat	RIN-5F	CRL-2058	198
liver	H4-II-E-C3	CRL-1600	153		RIN-14B	CRL-2059	198
	McA-RH7777	CRL-1601	153		RIN-m	CRL-2057	198
	McA-RH8994	CRL-1602	153	<b>Leiomyoblastoma</b>			
	MH <sub>1</sub> C <sub>1</sub>	CCL-144	83	human, kidney	G-402	CRL-1440	142
	NI-S1	CRL-1604	154	<b>Leiomyosarcoma</b>			
	NI-S1 Fudr	CRL-1603	154	hamster, Syrian	DDT <sub>1</sub> MF-2	CRL-1701	165
mammary	13762 MAT	CRL-1666	161	human	SK-LMS-1	HTB-88	283
	B III				SK-UT-1	HTB-114	292
	NMU	CRL-1743	169		SK-UT-1B	HTB-115	292
	RBA	CRL-1747	170	<b>Leukemias &amp; lymphomas</b>			
thyroid	6-23	CRL-1607	154	bovine	BL-3	CRL-8037	206
unspecified	LLC-WRC	CCL-38	23	cat	FeLV-3281	CRL-9116	215
	256			gibbon, lymphoma	MLA 144	TIB-201	339
<b>Chondrosarcoma</b>				human: <i>See also Burkitt lymphoma</i>			
human	SW 1353	HTB-94	286	blood	6T-CEM	CRL-8296	210
<b>Choriocarcinoma</b>					6T-CEM 20	CRL-8295	209
human	BeWo	CCL-98	59		AGR-ON	CRL-8199	209
	JAR	HTB-144	305		AML-193	CRL-9589	219
	JEG-3	HTB-36	257		CCRF-CEM	CCL-119	68
<b>Desmoid tumor</b>					CCRF-CEM	CRL-8436	210
human	D422T	CRL-1659	160		CCRF-HSB-2	CCL-120.1	69
<b>Fibroma</b>					CCRF-SB	CCL-120	68
gerbil, paw	IMR-33	CCL-146	84		CEM-CM3	TIB-195	338
<b>Fibrosarcoma</b>					CESS	TIB-190	338
human	Hs 913T	HTB-152	307		Clone 15	CRL-1964	188
	HT-1080	CCL-121	70		HL-60		
	SW684	HTB-91	284		DAKIKI	TIB-206	339
mouse	HSDM <sub>1</sub> C <sub>1</sub>	CCL-148	85		H9	HTB-176	315
	WEHI 164	CRL-1751	170		H33HJ-JA1	CRL-8163	208
<b>Glial tumor</b>					HEL 92.1.7	TIB-180	337
rat	C <sub>6</sub>	CCL-107	63		HL-60	CCL-240	127
<b>Glioblastoma</b>					HUT 78	TIB-161	335
human, brain	A-172	CRL-1620	156		HUT 102	TIB-162	336
	DBTRG-05MG	CRL-2020	195		J45.01	CRL-1990	190
	T98G	CRL-1690	164		J-99	CRL-8131	208
	U-87MG	HTB-14	245		J-111	CRL-8129	207
	U-118 MG	HTB-15	245		J-A1886	CRL-8130	208
	U-138 MG	HTB-16	246		J.CaM1.6	CRL-2063	199
	U-373 MG	HTB-17	246		JM1	CRL-10423	224
<b>Glioma</b>					J.RT3-T3.5	TIB-153	335
human, brain	Hs 683	HTB-138	303		Jurkat, clone E6-1	TIB-152	335
<b>Hepatoma</b>					MJ	CRL-8294	209
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	Hep 3B	HB-8064	226		Mo-B	CCL-245	130
	Hep G2	HB-8065	227		MOLT-3	CRL-1552	148
					MOLT-4	CRL-1582	150
					MV-4-11	CRL-9591	220
					OM.10.1	CRL-10850	226

\* No additional details; for an explanation see NBL Introduction, p. 344.

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<b>Leukemias &amp; lymphomas (continued)</b>							
human, blood (continued)	Reh	CRL-8286	209		BW5147.G.I.4		
	RPMI 8226	CCL-155	88		OUA <sup>R</sup> .I	CRL-1588	151
	RPMI 8402	CRL-1994	191		C1498	TIB-49	327
	SKW 6.4	TIB-215	340		EL4	TIB-39	326
	TALL-104	CRL-11386	226		EL4.BU	TIB-40	326
	THP-1	TIB-202	339		EL4.BU.1		
bone marrow	Dami	CRL-9792	221		OUA <sup>R</sup> .I.1	TIB-41	327
	HU-01	CRL-10249	223		EL 4.IL-2	TIB-181	337
	IM-9	CCL-159	90		LBRM-33	TIB-155	335
	KG-1	CCL-246	131		clone 4A2		
	KG-1 <sup>a</sup>	CRL-8031	206		R1.1	TIB-42	327
	KG-1 <sup>a</sup>	CCL-246.1 <sup>a</sup>	131		R1E/TL8x.1	TIB-43	327
	MEG-01	CRL-2021	195		R1E/TL8x.1	TIB-45	327
	RS4:11	CRL-1873	181		G1.OUA <sup>R</sup> .1		
	SUP-B15	CRL-1929	185		R1.G1	TIB-44	327
cervix	TF-1	CRL-2003	193		S1A.TB.4.8.2	TIB-27	325
	Hs 602	HTB-142	304		S49 (Thy-1-a)	TIB-36	326
	10C9	CRL-10236	222		S49.1	TIB-28	325
lymph node	Hs 445	HTB-146	305		S49.1G.3	TIB-34	326
	ARH-77	CRL-1621	156		S49.1G.3	TIB-35	326
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plasma cells	MC 116	CRL-1649	159		S49.1H.IAG.	TIB-29	325
	SUP-T1	CRL-1942	186		6/2		
	U-937	CRL-1593	152		S49.1TB.2	TIB-30	325
monkey, rhesus	LCL 8664	CRL-1805	174		S49.1TB.4	TIB-33	326
	mouse				DEX R.63		
	bone marrow	M-NFS-60	CRL-1838	176	TI-MI.4	TIB-37	326
lymph nodes	lymph nodes	BC3A	TIB-60	329	TI-MI.4G.1.3	TIB-38	326
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	lymphoblast	LBRM-33-1AS	CRL-8079	207	J774A.1	TIB-67	329
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	LBRM TG6	CRL-1778	172	(IL-1)			
	NFS-1.0 C-1	CRL-1705	165	PU5-1.8	TIB-61	329	
lymphoblast, pro-B	70Z/3	TIB-158	335	RAW 264.7	TIB-71	330	
	ABE-8.1/2	TIB-205	339	RAW 309	TIB-69	330	
	NFS-5 C-1	CRL-1693	164	Cr.1			
lymphoblast, pro-B	NFS-25 C-3	CRL-1695	164	WEHI 3	TIB-68	329	
	NFS-70 C-10	CRL-1694	164	WEHI 265.1	TIB-204	339	
	BW5147 (T200-a)5.2	TIB-233	342	WR19M.1	TIB-70	330	
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	L1210	CCL-219	116	M1	TIB-192	338	
	M1	TIB-192	338	spleen			
lymphomas, B	NCTC 3749	CCL-46.1	28	BB88	TIB-55	328	
	P388D <sub>1</sub>	CCL-46	27	BC3A	TIB-60	329	
	RAW309F.1.1	TIB-51	327	BC16A	TIB-59	328	
lymphomas, pre-B	S1A(Thy-1-b)	TIB-231	342	BCL <sub>1</sub>	TIB-197	338	
	WEHI 22.1	TIB-54	328	clone 5B <sub>1</sub> b			
	WR19L	TIB-52	328	subcutaneous			
lymphomas, pre-B	YAC-1	TIB-160	335	D1B	TIB-56	328	
	2PK-3	TIB-203	339	D2N	TIB-58	328	
	A20	TIB-208	340	thymus			
lymphomas, T	CH1	TIB-221	341	LS178Y-R	CRL-1722	167	
	RAW 8.1	TIB-50	327	LS178Y-S	CRL-1723	167	
	WEHI-23I	CRL-1702	165	LS178Y	CRL-9518	218	
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				G.OUAR.1			
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				human	SW872	HTB-92	285
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\* No additional details; for an explanation see NBL Introduction, p. 344.

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	CSMa $\beta$ 6C	CRL-8400	210		P3.6.2.8.1	TIB-8	323
	Mm5MT	CRL-1637	158		P3/NSI/1-	TIB-18	325
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<b>Mastocytoma</b>					P3X63Ag8	TIB-9	323
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<b>Medulloblastoma</b>					Ag8.653		
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	D341 Med	HTB-187	321		Ag8U.1		
	Daoy	HTB-186	320		RPC 5.4	TIB-12	324
<b>Melanoma</b>					S194/5.	TIB-19	325
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human	A-375	CRL-1619	156		S194/5.	CRL-8837	214
	A375.S2	CRL-1872	181		XXO.BU.1		
	A2058	CRL-11147	226		S194/	TIB-20	325
	C32	CRL-1585	151		S.XXO.BU.1		
	C32TG	CRL-1579	150		SHM-D33	CRL-1668	161
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	CHL-2	CRL-9451	218		Sp2/0-Ag14	CRL-8287	209
	COLO 829	CRL-1974	189		XC 1.5/51	TIB-16	324
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	G-361	CRL-1424	141	rat	Y3-Ag.1.2.3	CRL-1631	157
	HMCB	CRL-9607	221		YB2/0	CRL-1662	161
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	Hs 695T	HTB-137	303	<b>Neuroblastoma</b>			
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mouse	Clone M-3	CCL-53.1	31		D17	CRL-8468	211
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	SHM-D33	CRL-1668	161		KHOS/NP	CRL-1544	147
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mouse	45.6TG1.7	CRL-1608	154		U-2 OS	HTB-96	286
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\* No additional details; for an explanation see NBL Introduction, p. 344.

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bovine	BL-3	CRL-8037	206		R2C	CCL-97	58
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	DSN	CRL-9939	222		OUAR.I.26		
gibbon	UCD-MLA-144	HB-8370	227		R1.1	TIB-42	327
hamster	DDT, MF-2	CRL-1701	165	<b>Wilms' tumor</b>			
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	A673	CRL-1598	153	<b>METASTATIC TUMORS</b>			
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	HT-1080	CCL-121	70	to bone	Hs 696	HTB-151	307
	KHOS-240S	CRL-1545	147	to bone marrow	NCI-H209	HTB-172	312
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	SW982	HTB-93	285		NCI-H1688	CCL-257	139
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	Sarcoma 180	TIB-66	329		Tera-1	HTB-105	288
	WEHI 164	CRL-1751	170		Tera-2	HTB-106	289
quail	QT6	CRL-1708	166		A2058	CRL-11147	226
rat	Jensen	CCL-45	27		AN3 CA	HTB-111	290
	Sarcoma				BT-549	HTB-122	296
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	XC	CCL-165	95		Hs 695T	HTB-137	303
Teratocarcinoma					Hs 766T	HTB-134	302
human	PA-1	CRL-1572	149		HT-3	HTB-32	254
	Tera-1	HTB-105	288		KATO III	HTB-103	287
	Tera-2	HTB-106	289		LNCaP.FGC	CRL-1740	169
					LNCaP-FGC-	CRL-10995	226

\* No additional details; for an explanation see NBL Introduction, p. 344.

## TUMOR INDEX

Tumor/Species/Site	Name	ATCC® No.	Page	Tumor/Species/Site	Name	ATCC No.	Page
<b>Metastatic Tumors (continued)</b>							
human, to lymph nodes (continued)				head/face			
MS751	HTB-34	255		dog	CF11.T	CRL-6217	*
NCI-H292	CRL-1848	177			CF15.T	CRL-6218	*
NCI-H661	HTB-183	319		leg/hip			
NCI-H747	CCL-252	135		cat	FC77.T	CRL-6105	*
NCI-H820	HTB-181	317			FC81.T	CRL-6108	*
RPMI-7951	HTB-66	273		dog	CF17.T	CRL-6219	*
SK-MEL-1	HTB-67	273		mouse	MM36T(C)	CRL-6411	*
SK-MEL-3	HTB-69	274			MM47T	CRL-6424	*
SK-MEL-5	HTB-70	275		trunk			
SK-MEL-24	HTB-71	276		cat	FC100.T	CRL-6115	*
SW620	CCL-227	121		dog	CF24.T	CRL-6221	*
SW962	HTB-118	293		mouse	MM37T	CRL-6414	*
to mesentery	CaSki	CRL-1550	148	parakeet	MU12.T	CRL-6483	*
to omentum	COLO 587	CRL-2000	192				
	ME-180	HTB-33	255	<b>Connective and soft tissue</b>			
to pelvis	Hs 700T	HTB-147	306	mouse	+/- SCT	CRL-6469	*
to pericardial fluid	NCI-H441	HTB-174	313				
to peritoneal fluid	RF-48	CRL-1863	179	<b>Fibrosarcoma</b>			
to peritoneum	D283 Med	HTB-185	320	cat	FC65.T	CRL-6100	*
	NCI-H498	CCL-254	137	mouse	MM43T	CRL-6418	*
to pleura	ACNH	CRL-1611	155		MM46T	CRL-6423	*
	Calu-1	HTB-54	266		MM48T	CRL-6425	*
	MDA-MB-	HTB-129	300		MM49T	CRL-6426	*
	435S						
	MDA-MB-436	HTB-130	300	<b>Interscapular region</b>			
	MDA-MB-453	HTB-131	301	bat, mouse-eared	Mvi/It	CRL-6012	*
	MDA-MB-468	HTB-132	301				
	NCI-H82	HTB-175	314	<b>Liver</b>			
	NCI-H146	HTB-173	313	mouse	MM45T.Li	CRL-6421	*
	NCI-H446	HTB-171	312				
	NCI-H460	HTB-177	315	<b>Lung</b>			
	NCI-H676B	HTB-179	316	mouse	Mad/C3	CRL-6367	*
to skin	Caki-1	HTB-46	262				
	DU 4475	HTB-123	296	<b>Lymph node</b>			
	SK-MEL-2	HTB-68	274	bovine	2FLB.Ln	CRL-6045	*
to subcutaneous tissue	ChaGo K-1	HTB-168	311		2LBLN	CRL-6047	*
	HT-144	HTB-63	271		3LBLN	CRL-6048	*
	NCI-H125	CRL-5801	200		5LBLN	CRL-6049	*
to supraclavicular region	LoVo	CCL-229	122		6LBLN	CRL-6050	*
to supra-orbit	SK-N-MC	HTB-10	242	cat	LB9.Ln	CRL-6057	*
to umbilicus	COLO 829	CRL-1974	189		LB10.Ln	CRL-6062	*
mouse					LB11.Ln	CRL-6066	*
to lung	LL/2	CRL-1642	158	dog	LBLN	CRL-6046	*
					R2LBLN	CRL-6070	*
<b>NBL ANIMAL CANCER CELL LINES</b>							
Bladder				cat	F8	CRL-6074	*
mouse	MM45T.B1	CRL-6420	*		LFC16.Ln	CRL-6173	*
Bone				dog	CLN	CRL-6245	*
dog	D17	CRL-6248	*				
	D22	CRL-6250	*	<b>Lymph node, head/neck</b>			
	D39	CRL-6251	*	cat	F1B	CRL-6168	*
Bone marrow				cat	FC11.BM	CRL-6088	*
bovine	LB9.Bm	CRL-6053	*		FC11th	CRL-6089	*
	LB10.Bm	CRL-6060	*				
Carcinoma				<b>Mammary gland</b>			
rabbit, cottontail	Oc4T/cc	CRL-6501	*	dog	CF29.Mg	CRL-6224	*
Connective tissue					CF33.Mg	CRL-6227	*
arm/shoulder					CF34.Mg	CRL-6228	*
cat	FC94.T	CRL-6113	*		CF35.Mg	CRL-6229	*
dog	CF21.T	CRL-6220	*	dog	CF41.Mg	CRL-6232	*
mouse	MM36T(A)	CRL-6410	*		CF42.Mg	CRL-6233	*
parakeet	MU27	CRL-6487	*		CF45B.Mg	CRL-6237	*
					CF51.Mg/L1	CRL-6242	*
					CF51.Mg/L3	CRL-6243	*
				monkey, rhesus	CMMT	CRL-6299	*
					CMMT	CRL-6300	*
					110/C1		
					Mel III	CRL-6308	*
				mouse	B-29	CRL-6225	*
					B-63	CRL-6326	*
					CCL-51	CRL-6337	*
					L-8A	CRL-6363	*

\* No additional details; for an explanation see NBL Introduction, p. 344.

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Tumor/Species/Site	Name	ATCC® No.	Page	Tumor/Species/Site	Name	ATCC® No.	Page	
<b>NBL Animal Cancer Cell Lines</b>								
<b>Mammary gland (continued)</b>								
mouse (continued)	MM2MT	CRL-6373	*	Sarcoma				
				rat	XC	CRL-6603	*	
	MM2MTC	CRL-6374	*	Spleen				
	MM2SCT	CRL-6375	*	bovine	LB9.Sp	CRL-6058	*	
	MM5MT	CRL-6590	*		LB10.Sp	CRL-6063	*	
	MM5MTC	CRL-6378	*	cat	LB11.Sp	CRL-6067	*	
	MM5MTM	CRL-6379	*	mouse	FC81.Sp	CRL-6107	*	
	MMS/C1	CRL-6444	*		MM45T.Sp	CRL-6422	*	
	MM5.1	CRL-6380	*	Spleen/thymus/bone marrow pool				
	RIIIMT	CRL-6449	*	bovine	LB9.Sp/	CRL-6052	*	
	+/+ MGT	CRL-6468	*		Thy/Bm			
rat	Rn1T	CRL-6598	*	cat	FC83.Res	CRL-6567	*	
	Rn2Nod	CRL-6600	*	Thymus				
	Rn2T	CRL-6599	*	bovine	LB9.Thy	CRL-6059	*	
	SMT/2A	CRL-6602	*		LB10.Thy	CRL-6064	*	
	LNM				LB11.Thy	CRL-6068	*	
<b>Mastocytoma</b>					cat	FC81.Thy	CRL-6109	*
mouse	P815 MB	CRL-6448	*		FC95.Thy	CRL-6114	*	
<b>Melanoma</b>								
mouse	B16-F0	CRL-6322	*	<b>Thymus, erythroleukemia</b>				
	B16-F1	CRL-6323	*	cat	F25	CRL-6566	*	
<b>Papilloma</b>				<b>Unknown</b>				
rabbit, domestic	CTPS	CRL-6496	*	mouse	MM14.OT	CRL-6384	*	
<b>Pleural fluid</b>					MM15.OT	CRL-6438	*	
seal, harbor	PV1.P1	CRL-6526	*		MM52.T	CRL-6429	*	
<b>Retroperitoneum</b>					MM53.T	CRL-6431	*	
parakeet	MU13.T	CRL-6484	*	parakeet	MU10	CRL-6481	*	
				rabbit, domestic	VX7	CRL-6504	*	
				rat	Rn6T	CRL-6601	*	

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